Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

1 / 30

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CGCGTCCGGGCAGATTCACGTCGTTCCAGCCAAGTGGACCTGATCGATGGCCCTCCTGAATTTATCACGATATTTGAT
TTATTAGCGGATGCCCCCTGGTTTGTGTGTTGGTTACGCACACACGTGCACACAAGGCTCTGGCTCGCTTCCCTCCGTT
TCCAGCTCCTGGGCGAATCCCACATCTGTTTCAACTCTGTTCAACTTGAGAGCGCCGGAGAGTGTGTCGAATCTGCG
AGTGAAGAGGGACGAGGGAAAGAGAAACAAAGCCACAGACGCGCAACTTGAGACTCCCGATCCCAAAAGAAGCACCAGATC
AGCAAAAAAGAAG

 M   G   P   P   S   L   V   L   C   L   L   S   A   T   V   F                              16
ATG GGC CCC CCG AGC CTC GTG CTG TGC TTG CTG TCC GCA ACT GTG TTC                             48

 S   L   G   S   S   A   F   L   S   H   H   R   L   K   G   R   F   Q                        36
TCC CTG GGA AGC TCG GCC TTC CTG TCG CAC CAC CGC CTG AAA GGC AGG TTT CAG                     108

 R   D   R   N   I   R   P   N   I   L   D   D   Q   D   V                                    56
AGG GAC CGC AAC ATC CGC CCC AAC ATC CTG GAC GAC CAG GAT GTG                                 168

 E   L   G   S   M   Q   V   M   N   K   T   R   R   I   M   E   Q   G   T                     76
GAG CTG GGT TCC ATG CAG GTG ATG AAC AAG ACC CGG CGC ATC ATG GAG CAG GGG ACG                 228

 H   N   A   F   V   T   P   M   C   C   S   S   S                                            96
CAC AAC GCC TTC GTG ACC CCC ATG TGC TGC TCA TCC TCC                                         288

 T   G   K   Y   T   N   H   N   T   Y   N   E   N   C   S   I   S   P                        116
ACC GGC AAG TAC ACC AAC CAC AAC ACC TAC AAC GAG AAC TGC TCC ATC TCC CCC                     348

 S   W   Q   A   H   E   S   R   T   F   A   V   Y   L   N   S   T   G   Y                    136
TCC TGG CAG GCA CAC GAG AGC CGC ACC TTT GCC GTG TAC CTC AAT AGC ACT GGC TAC                 408
```

Fig. 1A

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2 / 30

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R    T    A    F    F    G    K    Y    L    N    E    Y    N    G    S    Y    V    P    P    G     156
CGG  ACA  GCT  TTC  TTC  GGG  AAG  TAT  CTT  AAT  GAA  TAC  AAC  GGC  TCC  TAC  GTG  CCA  CCC  GGC   468

W    K    E    W    V    G    L    L    K    N    S    R    Y    F    N    Y    T    L    C    R     176
TGG  AAG  GAG  TGG  GTC  GGA  CTC  CTT  AAA  AAC  TCC  CGC  TAT  TTT  AAC  TAC  ACG  CTG  TGT  CGG   528

N    G    V    K    E    K    H    L    K    H    G    P    E    D    Y    L    T    D    L    I     196
AAC  GGG  GTG  AAA  GAG  AAG  CAC  CTC  AAG  CAC  GGC  CCT  GAG  GAT  TAC  CTC  ACA  GAC  CTC  ATC   588

T    N    D    S    V    S    V    D    S    D    S    Y    D    M    Y    P    H    R    P    V     216
ACC  AAT  GAC  AGC  GTG  AGC  GTG  GAC  TCC  GAC  TCC  TAC  GAT  ATG  TAC  CCG  CAC  AGG  CCA  GTC   648

L    M    V    I    S    H    F    F    R    T    S    K    K    D    S    Y    P    Q    Y    S     236
CTC  ATG  GTC  ATC  AGC  CAC  TTC  TTC  CGC  ACG  TCC  AAG  AAG  GAT  TCA  TAC  CCG  CAA  TAT  TCA   708

R    F    P    N    A    H    A    A    P    H    G    P    S    Y    N    Y    A    P    N    P     256
CGC  TTC  CCA  AAC  GCA  CAT  GCC  GCA  CCC  CAC  GGC  CCT  TCA  TAC  AAC  TAC  GCG  CCC  AAC  CCG   768

D    K    W    I    M    R    Y    S    Q    I    T    P    S    P    I    H    M    E    F    T     276
GAC  AAA  TGG  ATC  ATG  CGC  TAC  TCT  CAG  ATC  ACG  CCG  AGC  CCC  ATC  CAC  ATG  GAA  TTC  ACC   828

N    M    Q    R    K    R    L    Q    L    T    S    V    D    M    D    D    S    M    E    T     296
AAC  ATG  CAG  CGG  AAG  CGG  TTG  CAG  CTC  ACC  TCG  GTG  GAC  ATG  GAC  GAC  TCC  ATG  GAG  ACG   888

I    Y    N    M    L    V    L    E    T    G    E    L    L    Y    I    Y    V    Y    T    A     316
ATT  TAC  AAC  ATG  CTG  GTT  CTG  GAG  ACG  GGC  GAG  CTG  CTG  TAC  ATC  TAC  GTA  TAC  ACC  GCC   948
```

Fig. 1B

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US   Attorney Docket No. 10147-61U1   Cust # 570

3 / 30

```
D   H   G   Y   H   I   G   Q   F   G   L   V   K   G   K   S   M   P   Y   E      336
GAC CAC GGT TAC CAC ATC GGC CAG TTT GGC CTG GTG AAA GGG AAA TCC ATG CCA TAT GAG   1008

F   D   I   R   V   P   F   Y   V   P   G   P   N   V   E   A   G   C   L   N      356
TTT GAC ATC AGG GTC CCG TTC TAC GTG CCC GGC CCC AAC GTG GAA GCC GGC TGT CTG AAT   1068

P   H   N   I   V   L   I   D   L   T   A   P   I   L   D   I   A   G   L   D      376
CCC CAC AAC ATC GTC CTC ATC GAC CTG ACC GCC CCC ATC CTG GAC ATT GCA GGC CTG GAC   1128

I   A   D   M   D   D   G   K   G   S   K   L   L   K   L   L   T   E   P   V      396
ATA CCT GAT ATG GAC GAC GGG AAA GGG TCC AAA CTG CTG AAG CTG CTG ACG GAG CCG GTG   1188

N   R   H   L   K   R   K   K   M   R   V   R   R   D   S   F   F   L   V   R      416
AAT CGG CAC TTG AAA AGA AAG AAG ATG AGG GTC AGG ATC GAC TCC TTC TTC TTG GTG AGA   1248

G   K   L   L   F   K   K   I   S   W   V   K   V   D   A   Q   E   E   N   F      436
GGC AAG CTA TTT TTT AAG AAA ATC TCC TGG GTC AAG GTG GAC GCC CAG GAG GAG AAC TTT   1308

P   K   Y   R   Q   V   K   D   N   L   R   A   Y   E   Y   Q   T   A   C   E      456
CCC AAG TAC CGT CAG GTG AAG GAC AAT CTG CGT GCT TAC GAG TAC CAG ACG GCG TGT GAG   1368

Q   L   Q   Q   K   W   Q   C   V   A   D   A   T   G   K   K   L   H   K   Y      476
CAG CTG CAG CAG AAG TGG CAG TGT GTG GCC GAC GCC ACG GGG AAG AAG CTG CAT AAG TAC   1428

C   K   P   M   R   R   S   G   G   R   R   A   L   S   N   L   V   P   K   Y      496
TGC AAG CCC ATG CGG AGA AGC GGC GGC AGA CGG GCC CTC TCC AAC CTC GTG CCC AAG TAC   1488
```

Fig. 1C

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U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

4 / 30

```
516 / 1548
A   L   S   L   K   Y   D   G   S   D   C   T   C   A   E   S   G   Q   G   Y
GCC CTG AGC CTC AAG TAC GAC GGG AGC GAC TGT ACC TGC GCC GAG AGC GGC CAG GGG TAC

536 / 1608
S   R   S   R   V   Y   S   A   K   Y   K   K   K   F   L   K   K   R   R   G
TCC CGC AGT CGC GTC TAT AGC GCC AAG TAC AAG AAG AAG TTC CTC AAA AAA CGG CGC GGA

556 / 1668
A   D   G   L   G   V   H   Y   V   R   D   V   V   E   I   A   V   S   R   I
GCC GAT GGT CTG GGC GTA CAC TAC GTG AGG GAC GTG GTG GAG ATC GCC GTG TCA CGC ATC

576 / 1728
D   D   Q   D   E   P   A   G   P   W   H   R   K   T   L   N   R   P   Q   A
GAC GAT CAA GAC GAG CCT GCC GGG CCA TGG CAC CGG AAG ACC CTC AAC CGA CCC CAG GCC

596 / 1788
P   N   A   A   S   Y   D   P   L   G   G   T   G   S   F   D   G   G   D   K
CCC AAC GCC GCC TCA TAC GAC CCC CTT GGC GGA ACT GGC AGT TTC GAC GGG GGT GAT AAG

616 / 1848
D   L   D   C   Q   V   T   D   N   E   L   I   Y   C   R   H   T   V   K   I
GAC CTG GAC TGT CAG GTC ACA GAC AAC GAG CTA ATC TAC TGC CGG CAT ACA GTG AAA ATT

636 / 1908
E   I   E   H   D   I   H   L   K   H   D   K   W   A   Q   L   K   S   Y   L
GAA ATT GAG CAC GAC ATC CAC CTG AAG CAC GAC AAG TGG GCC CAG CTG AAG TCC TAC CTG

656 / 1968
R   K   K   K   K   H   G   R   V   E   R   L   N   K   I   K   N   N   L   T
CGG AAG AAA AAG AAG CAC GGT CGA GTC GAA AGG CTG AAC AAG ATT AAA AAC AAC CTG ACC

676 / 2028
K   L   R   G   K   H   Q   T   H   Y   S   I   K   H   C   D   C   E   L   P
AAG CTC CGC GGC AAA CAC CAG ACC CAC TAC AGC ATC AAA CAC TGT GAC TGT GAA CTG CCA
```

Fig. 1D

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5 / 30

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H   R   G   S   S   L   H   P   F   R   K   G   L   Q   E   K   D   K   V   W    696
CAC AGA GGC TCC AGT CTG CAT CCT TTC AGG AAG GGC CTG CAA GAG AAG GAC AAG GTG TGG  2088

L   L   R   E   Q   K   R   K   K   K   L   R   K   L   L   K   R   L   Q   N    716
CTG TTG CGG GAG CAG AAG CGC AAG AAA AAA CTC CGC AAG CTG CTC AAG CGC CTG CAG AAC  2148

N   D   T   C   S   M   P   G   L   T   C   F   L   H   D   N   Q   H   W   Q    736
AAC GAC ACG TGC AGC ATG CCA GGC CTC ACG TGC TTC CTC CAC GAC AAC CAG CAC TGG CAG  2208

T   A   P   F   W   T   L   L   G   P   C   A   C   T   S   A   N   N   N   T    756
ACG GCG CCT TTC TGG ACA CTG CTG GGG CCT TGC GCC TGC ACC AGC GCC AAC AAT AAC ACG  2268

Y   W   C   M   R   T   I   N   E   T   H   N   F   L   F   C   E   F   A   T    776
TAC TGG TGC ATG AGG ACC ATC AAT GAG ACT CAC AAT TTC CTC TTC TGT GAA TTT GCA ACT  2328

G   F   M   C   Y   F   D   L   N   T   D   P   Y   Q   L   M   N   A   V   N    796
GGC TTC ATG TGC TAC TTT GAT CTC AAC ACA GAC CCC TAC CAG CTG ATG AAT GCA GTG AAC  2388

T   D   R   R   D   V   L   N   Q   L   H   V   Q   L   M   E   L   R   S   C    816
ACA GAC AGG AGG GAT GTC CTC AAC CAG CTA CAC GTA CAG CTC ATG GAG CTG AGG AGC TGC  2448

K   Y   K   Q   Q   C   N   P   R   T   R   N   M   D   L   G   L   K   D   G    836
AAG TAC AAG CAG CAG TGT AAC CCC CGG ACT CGA AAC ATG GAC CTG GGA CTT AAA GAT GGA  2508

G   S   Y   E   Q   Y   R   Q   F   Q   R   Q   K   W   P   E   M   K   R   P    856
GGA AGC TAT GAG CAA TAC AGG CAG TTT CAG CGT CAG AAG TGG CCA GAA ATG AAG AGA CCT  2568
```

Fig. 1E

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6 / 30

870
2613

S S K S L G Q L W E G W E G *
TCT TCC AAA TCA CTG GGA CAA CTG TGG GAA GGC TGG GAA GGT TAA

GAAACAACAGAGAGGTGGACCTCCAAAAAACATAGAGGCCATCACCTGACTGCACAGGCAATGAAAAACCATGTGGGTGATTT
CCAGCAGACCCTGTGCTATTGGCCAGGAGGCCTGAGAAAGCACGCACTCTCAGTCAACATGACAGATTCTGGAGGA
TAACCAGCAGGAGCAGAGATAACTTCAGGAAGTCCATTTTGCCCCTGCTTTTGCTTTGGATTATACCTCACCAGCTGC
ACAAAATGCATTTTTTCGTATCAAAAAGTCACCACTAACCCTCCCCCAGAAGCTCACAAAGGAAAACGGAGAGAGCGAG
CGAGAGAGATTTCCTTGGAAATTTCTCCCAAGGGCGAAAGTCATTGGAATTTTTAAATCATAGGGGAAAAAGCAGTCCTG
TTCTAAATCCCTCTTATTCTTTTGGTTTGTCACAAAGAAGAACTAAGAAGCAGGACAGAGCCAACGTGGAGAGGCTGAA
AACAGTGCCAGAGACGTTTGACAATGAGTCAGTAGCCACTAGCACTATAAACCCTGGTTGCC
TCTGAAGAACTGCCTT

Fig. 1F

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7 / 30

Fig. 2

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

8 / 30
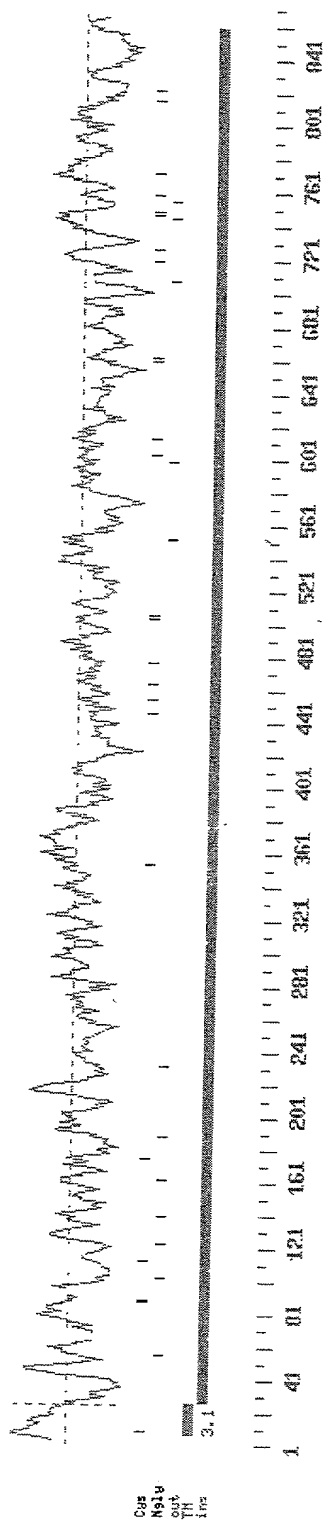
```
22437  -----------------------------------------------------------

1247   GAGCGAGAGTGTGTCGAGTGAGTGTGCGTCTGTGTGTCCCGGGGAGGGTGCGCGGCTCGGC
                10        20        30        40        50        60

22437  -----------------------------------------------------------

1247   GCCGGGGAGCGGGGCCAGCCGAGTCCGGAGGCATCGGGGAGGTCGAGAGCCGCCGGGACCCC
                70        80        90       100       110       120

22437  -----------------------------------------------------------

1247   AGCTCTGCGTTCACTGCCCCGTCCGGAGCTGGACTTCGGGGCCGGGGCCGGGGCCGTGCG
               130       140       150       160       170       180

22437  -----------------------------------------------------------

1247   CCGGGGACAGGCAGGCCCGGGTGCGGCGCGTCCCCCAGGCCGGAGATCTGCGAGT
               190       200       210       220       230       240
```

Fig. 3A

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

9 / 30

```
22437  ------------------------------------------------------------

1247   GAAGAGGGACAAGGGAAAAAGAAACAAAGCCACAGACGCAACTTGAGACTCCCGCATCCCA
              250       260       270       280       290       300

22437  ------------------------------ATGGGCCCCCCGAGCCTCGTGCTGTGCTTG
                                       10        20        30
                                      :: ..::  :::: :::::::::::::::
1247   AAAGAAGCACCAGATCAGCAAAAAAGAAGAGATGGGCCCCCCGAGCCTCGTGCTGTGCTTG
              310       320       330       340       350       360

22437  CTGTCCGCAACTGTGTTCTCCCTGCTGGGGTGGAAGCTCGGCCTTCCTGTCGCACCACCGC
              40        50        60        70        80        90
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
1247   CTGTCCGCAACTGTGTTCTCCCTGCTGGGGTGGAAGCTCGGCCTTCCTGTCGCACCACCGC
              370       380       390       400       410       420

22437  CTGAAAGGCAGGTTTCAGAGGGACCGGCAGGAACATCCGCCCCAACATCATCCTGGTGCTG
              100       110       120       130       140       150
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
1247   CTGAAAGGCAGGTTTCAGAGGGACCGGCAGGAACATCCGCCCCAACATCATCCTGGTGCTG
              430       440       450       460       470       480
```

Fig. 3B

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Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

10 / 30

```
                 160       170       180       190       200       210
22437  ACGGACGACCAGGAGGATGTGGAGCTGGGGTTCCATGCAGGTGATGAACAAGACCCGGGCGCATC
            :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::
1247   ACGGACGACCAGGAGGATGTGGAGCTGGGGTTCCATGCAGGTGATGAACAAGACCCGGGCGCATC
                 490       500       510       520       530       540

                 220       230       240       250       260       270
22437  ATGGAGCAGGGCGGGACGCACTTCATCAACGCCCTTCGTGACCACACCCATGTGCTGCCCC
            :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::
1247   ATGGAGCAGGGCGGGACGCACTTCATCAACGCCCTTCGTGACCACACCCATGTGCTGCCCC
                 550       560       570       580       590       600

                 280       290       300       310       320       330
22437  TCACGCTCCTCCATCCCTCACCGGCAAGTACGTCCACAACCACAACCTACACCAACAAT
            :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::
1247   TCACGCTCCTCCATCCCTCACCGGCAAGTACGTCCACAACCACAACCTACACCAACAAT
                 610       620       630       640       650       660

                 340       350       360       370       380       390
22437  GAGAACTGCTCCTCGCCCTCCTGGCAGGCACAGCACGAGAGCCGCACCTTTGCCGTGTAC
            :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::
1247   GAGAACTGCTCCTCGCCCTCCTGGCAGGCACAGCACGAGAGCCGCACCTTTGCCGTGTAC
                 670       680       690       700       710       720
```

Fig. 3C

```
          400        410        420        430        440        450
22437  CTCAATAGCACTGGCTACCGGACACAGCTTTCTTCGGGAAGTATCTTAATGAATACAACGGC
       :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247   CTCAATAGCACTGGCTACCGGACACAGCTTTCTTCGGGAAGTATCTTAATGAATACAACGGC
          730        740        750        760        770        780

          460        470        480        490        500        510
22437  TCCTACGTGCCACCCGGCTGGAAGGAGTGGGTCGGACTCCTTAAAAACTCCCGCTTTTTAT
       :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247   TCCTACGTGCCACCCGGCTGGAAGGAGTGGGTCGGACTCCTTAAAAACTCCCGCTTTTTAT
          790        800        810        820        830        840

          520        530        540        550        560        570
22437  AACTACACGCTGTGTCGGAACGGGGTGAAAGAGAAGCACGGCTCCGACTACTCCAAGGAT
       :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247   AACTACACGCTGTGTCGGAACGGGGTGAAAGAGAAGCACGGCTCCGACTACTCCAAGGAT
          850        860        870        880        890        900

          580        590        600        610        620        630
22437  TACCTCACAGACCTCATCACCAATGACACAGCCGTGAGCTTCTTCCGCACGTCCAAGAAGATG
       :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247   TACCTCACAGACCTCATCACCAATGACACAGCCGTGAGCTTCTTCCGCACGTCCAAGAAGATG
          910        920        930        940        950        960
```

Fig. 3D

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Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

12 / 30

Fig. 3E

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
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Express Mail # EL665882062US Attorney Docket No 10147-61U1 Cust # 570

13 / 30

```
            880        890        900        910        920        930
22437  GACGACTCCATGGAGAGACGATTTACAACATGCTGGTTGAGACGGGGCGAGCTGGACAACACG
       :: :: :: :: :: :: :: :: :: :: ::: :: ::: :: ::: :: ::: ::: ::
1247   GACGACTCCATGGAGAGACGATTTACAACATGCTGGTTGAGACGGGGCGAGCTGGACAACACG
            1210       1220       1230       1240       1250       1260

            940        950        960        970        980        990
22437  TACATCGTATACACCGCCGACCACGGTTACCACATCGGCCCAGTTTGGCCTGGTGAAAGGG
       :: :: :: :: :: :: :: ::: :: ::: :: ::: :: ::: ::: :: :: ::
1247   TACATCGTATACACCGCCGACCACGGTTACCACATCGGCCCAGTTTGGCCTGGTGAAAGGG
            1270       1280       1290       1300       1310       1320

            1000       1010       1020       1030       1040       1050
22437  AAATCCATGCCATATGAGTTTGACATCAGGGGTCCCGTTCTACGTGAGGGGCCCCAACGTG
       :: :: :: :: :: ::: :: ::: :: ::: :: ::: :: ::: ::: :: :: ::
1247   AAATCCATGCCATATGAGTTTGACATCAGGGGTCCCGTTCTACGTGAGGGGCCCCAACGTG
            1330       1340       1350       1360       1370       1380

            1060       1070       1080       1090       1100       1110
22437  GAAGCCGGCTGTCTGAATCCCCACATCGTCCTCAACATTGACCTGGCCCCCACCATCCTG
       :: :: :: :: ::: :: ::: :: ::: :: ::: :: ::: ::: :: :: :: ::
1247   GAAGCCGGCTGTCTGAATCCCCACATCGTCCTCAACATTGACCTGGCCCCCACCATCCTG
            1390       1400       1410       1420       1430       1440
```

Fig. 3F

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Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

14 / 30

22437

1120   1130   1140   1150   1160   1170
GACATTGCAGGCCTGGACATACCTGCGGGATATGGACGGGGAAATCCATCCTCAAGCTGCTG
:: :: :   ::   :::   :::   :::   ::: :: ::: ::: :::

1247

1450   1460   1470   1480   1490   1500
GACATTGCAGGCCTGGACATACCTGCGGGATATGGACGGGGAAATCCATCCTCAAGCTGCTG

22437

1180   1190   1200   1210   1220   1230
GACACGGGAGCGGCCGGTGAATCGGTTTCACTTGAAAAAGAAGATGAGGGTCTGGCGGGAC
::   ::   :::   ::   ::: :::   :::

1247

1510   1520   1530   1540   1550   1560
GACACGGGAGCGGCCGGTGAATCGGTTTCACTTGAAAAAGAAGATGAGGGTCTGGCGGGAC

22437

1240   1250   1260   1270   1280   1290
TCCTTCTTGGTGGAGAGAGGCAAGCTGCTACACAGAGACAATGACAAGGTGGACGCC
::   :::   :::::   :::::   :::

1247

1570   1580   1590   1600   1610   1620
TCCTTCTTGGTGGAGAGAGGCAAGCTGCTACACAGAGACAATGACAAGGTGGACGCC

22437

1300   1310   1320   1330   1340   1350
CAGGAGGAGAACTTTCTGCCCAAGTACCAGCGTGTGAAGGACCTGTGTCAGCGTGCTGAG
::   ::   :::   :::::   :::

1247

1630   1640   1650   1660   1670   1680
CAGGAGGAGAACTTTCTGCCCAAGTACCAGCGTGTGAAGGACCTGTGTCAGCGTGCTGAG

Fig. 3G

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15 / 30

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                    1360      1370      1380      1390      1400      1410
22437   TACCAGACGGGCGTGTGTGAGCAGCTGGGACAGAGAAGTGGCAGTGTGTGGAGGACGCCACGGGG
             :  : :::  :::  :::  :::  :::  :::  :::  :::  :::  :::  ::
1247    TACCAGACGGGCGTGTGTGAGCAGCTGGGACAGAGAAGTGGCAGTGTGTGGAGGACGCCACGGGG
                    1690      1700      1710      1720      1730      1740

                    1420      1430      1440      1450      1460      1470
22437   AAGCTGAAGCTGCATAAGTGCAAGGGCCCCATGCGGGGCTGGGCGCAGCAGAGCCCTCTCC
             :  : :::  :::  :::  :::  :::  :::  :::  :::  :::  :::  ::
1247    AAGCTGAAGCTGCATAAGTGCAAGGGCCCCATGCGGGGCTGGGCGCAGCAGAGCCCTCTCC
                    1750      1760      1770      1780      1790      1800

                    1480      1490      1500      1510      1520      1530
22437   AACCTCGTGCCCAAGTACTACGGGCAGGGCAGCGAGGCCTGCACCTGTGACAGCGGGGAC
             :  : :::  :::  :::  :::  :::  :::  :::  :::  :::  :::  ::
1247    AACCTCGTGCCCAAGTACTACGGGCAGGGCAGCGAGGCCTGCACCTGTGACAGCGGGGAC
                    1810      1820      1830      1840      1850      1860

                    1540      1550      1560      1570      1580      1590
22437   TACAAGCTCAGCCTGGCCGGACGCCGGAAAAAACTCTTCAAGAAGAAGTACAAGGCCAGC
             :  : :::  :::  :::  :::  :::  :::  :::  :::  :::  :::  ::
1247    TACAAGCTCAGCCTGGCCGGACGCCGGAAAAAACTCTTCAAGAAGAAGTACAAGGCCAGC
                    1870      1880      1890      1900      1910      1920
```

Fig. 3H

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

16 / 30

```
                  1600      1610      1620      1630      1640      1650
22437   TATGTCCGCAGTCGCTCCATCCGCTCAGTGTGGCCATCGAGGTGGACGGCCAGGGTGTACCAC
        : : :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247    TATGTCCGCAGTCGCTCCATCCGCTCAGTGTGGCCATCGAGGTGGACGGCCAGGGTGTACCAC
                  1930      1940      1950      1960      1970      1980

                  1660      1670      1680      1690      1700      1710
22437   GTAGGCCTGGGTGATGCCGCCCAGCCCCGAAACCCTCACCAAGCGGCACTGGCCAGGGGCC
        :: : :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247    GTAGGCCTGGGTGATGCCGCCCAGCCCCGAAACCCTCACCAAGCGGCACTGGCCAGGGGCC
                  1990      2000      2010      2020      2030      2040

                  1720      1730      1740      1750      1760      1770
22437   CCTGAGGACCAAGATGACAAGGATGGTGGGGACTTCAGTGGCACTGGGAGGCCTTCCCGAC
        :: : :: : :: : :: : :: : :: :: :: :: :: :: :: :: :: :: :: ::
1247    CCTGAGGACCAAGATGACAAGGATGGTGGGGACTTCAGTGGCACTGGGAGGCCTTCCCGAC
                  2050      2060      2070      2080      2090      2100
```

Fig. 3I

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U S. Patent Appl. No.. **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No 10147-61U1 Cust # 570

17 / 30

```
                      1780      1790      1800      1810      1820      1830
22437   TACTCAGCCGGCCAACCCCATTAAAGTGACACATCGGTGCTACATCCTAGAGAACGACACA
              ::        ::        ::        ::        ::        ::
1247    TACTCAGCCGGCCAACCCCATTAAAGTGACACATCGGTGCTACATCCTAGAGAACGACACA
                      2110      2120      2130      2140      2150      2160

                      1840      1850      1860      1870      1880      1890
22437   GTCCAGTGTGACCTGGACCTGTACAAGTCCCTGCAGGCCTGGAAAGACCACAAGCTGCAC
              ::        ::        ::        ::        ::        ::
1247    GTCCAGTGTGACCTGGACCTGTACAAGTCCCTGCAGGCCTGGAAAGACCACAAGCTGCAC
                      2170      2180      2190      2200      2210      2220

                      1900      1910      1920      1930      1940      1950
22437   ATCGACCACGAGATTGAAACCCTGCAGAACAAAATTAAGAACCTGAGGGAAGTCCGAGGT
              ::        ::        ::        :::       ::        :::
1247    ATCGACCACGAGATTGAAACCCTGCAGAACAAAATTAAGAACCTGAGGGAAGTCCGAGGT
                      2230      2240      2250      2260      2270      2280

                      1960      1970      1980      1990      2000      2010
22437   CACCTGAAAGAAAAAGCGGCCAGAAGAATGTGACTGTCACAAAATCAGCTACCACACCCAG
              ::        ::        ::        ::        ::        ::
1247    CACCTGAAAGAAAAAGCGGCCAGAAGAATGTGACTGTCACAAAATCAGCTACCACACCCAG
                      2290      2300      2310      2320      2330      2340
```

Fig. 3J

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No. **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

18 / 30

```
                  2020       2030       2040       2050       2060       2070
22437   CACAAAGGCCGCCTCAAGCACACAGAGGCTCCAGTCTGCATCCTTTCAGGAAGGGCCTGCAA
        ::  :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247    CACAAAGGCCGCCTCAAGCACACAGAGGCTCCAGTCTGCATCCTTTCAGGAAGGGCCTGCAA
                  2350       2360       2370       2380       2390       2400

                  2080       2090       2100       2110       2120       2130
22437   GAGAAGGACAAGGTGTGGCTGTTGCGGGAGCAGAAGCGCAGAGAAGAAACTCCGCAAGCTG
        ::  :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247    GAGAAGGACAAGGTGTGGCTGTTGCGGGAGCAGAAGCGCAGAGAAGAAACTCCGCAAGCTG
                  2410       2420       2430       2440       2450       2460

                  2140       2150       2160       2170       2180       2190
22437   CTCAAGCGCCTGCAGAACAACGACACGTGCAGCATGCCAGGCCTCACGTGCTTCACCCAC
        ::  :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247    CTCAAGCGCCTGCAGAACAACGACACGTGCAGCATGCCAGGCCTCACGTGCTTCACCCAC
                  2470       2480       2490       2500       2510       2520

                  2200       2210       2220       2230       2240       2250
22437   GACAACCAGCACACTGGCAGACGGGCGCCTTTCTGGACACTGGGGCCTTTCTGTGCCTGCACC
        ::  :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247    GACAACCAGCACACTGGCAGACGGGCGCCTTTCTGGACACTGGGGCCTTTCTGTGCCTGCACC
                  2530       2540       2550       2560       2570       2580
```

Fig. 3K

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: Not Yet Assigned
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

19 / 30

```
                 2260      2270      2280      2290      2300      2310
22437  AGCGCCAACAATAACACGTACTGGTGCATGAGGACCATCAATGAGACTCACAATTTCCTC
                 :::: :::: :::: :::: :::: :::: :::: :::: :::: :::: ::
                 2590      2600      2610      2620      2630      2640
1247   AGCGCCAACAATAACACGTACTGGTGCATGAGGACCATCAATGAGACTCACAATTTCCTC

                 2320      2330      2340      2350      2360      2370
22437  TTCTGTGAATTTGCAACTGGCTTCCTAGAGTACTTTGATCTCAACACAGACCCCTACCAG
                 :::: :::: :::: :::: :::: :::: :::: :::: :::: :::: ::
                 2650      2660      2670      2680      2690      2700
1247   TTCTGTGAATTTGCAACTGGCTTCCTAGAGTACTTTGATCTCAACACAGACCCCTACCAG

                 2380      2390      2400      2410      2420      2430
22437  CTGATGAATGCAGTGAACACACTGGACAGGGATGTCCTCAACCAGCTACACGTACAGCTC
                 :::: :::: :::: :::: :::: :::: :::: :::: :::: :::: ::
                 2710      2720      2730      2740      2750      2760
1247   CTGATGAATGCAGTGAACACACTGGACAGGGATGTCCTCAACCAGCTACACGTACAGCTC

                 2440      2450      2460      2470      2480      2490
22437  ATGGAGCTGAGGAGCTGCAAGGGTTACAAGCAGTGTAACCCCCGGACTCGAAAACATGGAC
                 :::: :::: :::: :::: :::: :::: :::: :::: :::: :::: ::
                 2770      2780      2790      2800      2810      2820
1247   ATGGAGCTGAGGAGCTGCAAGGGTTACAAGCAGTGTAACCCCCGGACTCGAAAACATGGAC
```

Fig. 3L

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

20 / 30

```
                    2500       2510       2520       2530       2540       2550
22437     CTGGGACTTAAAGATGGGAGGAAGCTATGAGCAATACAGGCAGTTTCAGCGTCGAAAGTGG
          :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247      CTGGGACTTAAAGATGGGAGGAAGCTATGAGCAATACAGGCAGTTTCAGCGTCGAAAGTGG
                    2830       2840       2850       2860       2870       2880

                    2560       2570       2580       2590       2600       2610
22437     CCAGAAATGAAGAGACCTTCTTCCAAATCACTGGGACAACTGTGGGAAGGCTGGGAAGGT
          :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: :: ::
1247      CCAGAAATGAAGAGACCTTCTTCCAAATCACTGGGACAACTGTGGGAAGGCTGGGAAGGT
                    2890       2900       2910       2920       2930       2940

22437     TAA---------------------------------------------------------
          :: :
1247      TAAGAAACAACAGAGGTGGACCTCCAAAAACATAGAGGCATCACCTGACTGCACAGGCAA
                    2950       2960       2970       2980       2990       3000

22437     ------------------------------------------------------------

1247      TGAAAAACCATGTGGGTGATTTCCAGCAGACCTGTGCTATTGGCCAGGAGGCCTGAGAAA
                    3010       3020       3030       3040       3050       3060
```

Fig. 3M

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

21 / 30

22437

1247   GCAAGCACGCACTCTCAGTCAACATGACAGATTCTGGAGGATAACCAGCAGGAGCAGAGA
       3070   3080   3090   3100   3110   3120

22437

1247   TAACTTCAGGAAGTCCATTTTTGCCCCTGCTTTTGGATTATACCTCACCAGCTGC
       3130   3140   3150   3160   3170   3180

22437

1247   ACAAAATGCATTTTTTCGTATCAAAAAGTCACCACTAACCCTCCCCCAGAAGCTCACAAA
       3190   3200   3210   3220   3230   3240

22437

1247   GGAAAACGGAGAGAGCGAGCGAGAGAGATTTCCTTGGAAATTTCTCCCAAGGGCGAAAGT
       3250   3260   3270   3280   3290   3300

Fig. 3N

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No · **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

22 / 30

22437 |

1247 CATTGGAATTTTTAAATCATAGGGGGAAAAAGCAGTCCTGTTCTAAATCCTCTTATTCTTTT
      3310   3320   3330   3340   3350   3360

22437 |

1247 GGTTTGTCACAAAGAAGGAACTAAGAAGCAGGACAGAGGCAACGTGGAGAGGCTGAAAAAC
      3370   3380   3390   3400   3410   3420

22437 |

1247 AGTGCAGAGAGCGTTTGACAATGAGTCAGTAGCCACAAAAGAGATGACATTTACCTAGCACT
      3430   3440   3450   3460   3470   3480

22437 |

1247 ATAAACCCCTGGTTGCCTCTGAAGAAACTGCCCTTCATTGTATATATGTGACTATTTACATG
      3490   3500   3510   3520   3530   3540

Fig. 30

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

23 / 30

22437 |---|

1247   TAATCAACACATGGGAACTTTTAGGGGAACCTAATAAGAAATCCCAATTTTCAGGAGTGGTG
         3550   3560   3570   3580   3590   3600

22437 |---|

1247   GTGTCAATAAACGGCTCTGTGGCCAGTGTAAAAGAAAATCCCTCGGCAGTTGTGGACATTTC
         3610   3620   3630   3640   3650   3660

22437 |---|

1247   TGTTCCTGTCCAGATACCATTTCTCCTAGTATTTCTTTGTTATGTCCCAGAACTGATGTT
         3670   3680   3690   3700   3710   3720

22437 |---|

1247   TTTTTTTAAGGTACTGAAAAGAAATGAAGTTGATGTATGTCCCAAGTTTTGATGAAACT
         3730   3740   3750   3760   3770   3780

Fig. 3P

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

24 / 30

22437

1247   GTATTTGTAAAAAAAATTTTGTAGTTTAAGTATTGTCATACAGTGTTCAAAACCCCAGCC
        3790   3800   3810   3820   3830   3840

22437

1247   AATGACCAGCAGTTGGTATGAAGAACCCTTTGACATTTTGTAAAAGGCCATTTCTTTCTTG
        3850   3860   3870   3880   3890   3900

22437

1247   GGAGTTTTTTGGTGTGTCTGTTTTTTTTAAAGTATTCAAGATACTACCAGTCAACATCTTT
        3910   3920   3930   3940   3950   3960

22437

1247   TTGGAAGAAAATGCCTTGGGTTTAGAAGATTTTCTTAAAAGGGGAGTAGATGGTTGTAGA
        3970   3980   3990   4000   4010   4020

Fig. 3Q

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.. **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

25 / 30

22437   --

1247   TTGACTAAAAAGTCTACCATACTTCAAGGGACTACAGGTAAGTCTCATAGTATACCAGCT
      4030   4040   4050   4060   4070   4080

22437   --

1247   TTGGTACTTCATTTTTTAAAAAAGTATTAATCAATTGCAAAGAAATTCGCCTTGGCCAAC
      4090   4100   4110   4120   4130   4140

22437   --

1247   CCTTCTTTGTGTATCAGGTAGTCTAACCTGATACAAGTAGTTGACAGATTTCAACTATCA
      4150   4160   4170   4180   4190   4200

22437   --

1247   ATCACCAGTCCAACCCATTTCTCATTTAACAGATGACGGAGATAATCCCTAAAAGCACCC
      4210   4220   4230   4240   4250   4260

Fig. 3R

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

26 / 30

22437

1247 ACATTTGTTTCAATGCCCCAAACAGGCCAAGGCTCCCTAGCAACTCCCTAGTGGCGTTTT
           4270   4280   4290   4300   4310   4320

22437

1247 TTAACTTCTCAGAAACTGTTACCATTATTTGAAATAGGCTTCCTTAACCTCCTTTACCCT
           4330   4340   4350   4360   4370   4380

22437

1247 TAACCCAACAGGGATTT
           4390

Fig. 3S

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

27 / 30

```
                              10        20        30        40
22437    ------------------MGPPSLVLCLLSATVFSLLGGSSAFLSHHRLKGRFQRDRRNIRPN
                           ::::::::::::::::::::::::::::::::::::::::::::
1247     DSRIPKEAPDQQKKKMGPPSLVLCLLSATVFSLLGGSSAFLSHHRLKGRFQRDRRNIRPN
              50        60        70        80        90       100

                              70        80        90       100       110       120
22437    IILVLTDDQDVELGSMQVMNKTRRIMEQGGTHFINAFVTTPMCCPSRSSILTGKYVHNHN
         :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
1247     IILVLTDDQDVELGSMQVMNKTRRIMEQGGTHFINAFVTTPMCCPSRSSILTGKYVHNHN
             110       120       130       140       150       160

                             130       140       150       160       170       180
22437    TYTNNENCSSPSWQAQHESRTFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLK
         :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
1247     TYTNNENCSSPSWQAQHESRTFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLK
             170       180       190       200       210       220

                             190       200       210       220       230       240
22437    NSRFYNYTLCRNGVKEKHGSDYSKDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAP
         :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
1247     NSRFYNYTLCRNGVKEKHGSDYSKDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAP
             190       200       210       220       230       240
```

Fig. 4A

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

28 / 30

```
                    230       240       250       260       270       280
22437   HGPEDSAPQYSRLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKRLQ
        :: ::: :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: :::
1247    HGPEDSAPQYSRLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKRLQ
                    250       260       270       280       290       300

                    290       300       310       320       330       340
22437   TLMSVDDSMETIYNMLVETGELDNTYIVYTADHGYHIGQFGLVKGKSMPYEFDIRVPFYV
        :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: :::
1247    TLMSVDDSMETIYNMLVETGELDNTYIVYTADHGYHIGQFGLVKGKSMPYEFDIRVPFYV
                    310       320       330       340       350       360

                    350       360       370       380       390       400
22437   RGPNVEAGCLNPHIVLNIDLAPTILDIAGLDIPADMDGKSILKLLDTERPVNRFHLKKKM
        :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: :::
1247    RGPNVEAGCLNPHIVLNIDLAPTILDIAGLDIPADMDGKSILKLLDTERPVNRFHLKKKM
                    370       380       390       400       410       420

                    410       420       430       440       450       460
22437   RVWRDSFLVERGKLLHKRDNDKVDAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCV
        :: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: :::
1247    RVWRDSFLVERGKLLHKRDNDKVDAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCV
                    430       440       450       460       470       480
```

Fig. 4B

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

29 / 30

```
                  470        480        490        500        510        520
22437   EDATGKLKLHKCKGPMRLGGSRALSNLVPKYYGQGSEACTCDSGDYKLSLAGRRKKLFKK
               :::::::::::::::::::::::::::::::::::::::::::::::: :: :::
1247    EDATGKLKLHKCKGPMRLGGSRALSNLVPKYYGQGSEACTCDSGDYKLSLAGRRKKLFKK
                  490        500        510        520        530        540

                  530        540        550        560        570        580
22437   KYKASYVRSRSIRSVAIEVDGRVYHVGLGDAAQPRNLTKRHWPGAPEDQDDKDGGDFSGT
               :::::::::::::::::::::::::::::::::::::::::::::::: :: :::
1247    KYKASYVRSRSIRSVAIEVDGRVYHVGLGDAAQPRNLTKRHWPGAPEDQDDKDGGDFSGT
                  550        560        570        580        590        600

                  590        600        610        620        630        640
22437   GGLPDYSAANPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKIKNL
               :::::::::::::::::::::::::::::::::::::::::::::::: :: :::
1247    GGLPDYSAANPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKIKNL
                  610        620        630        640        650        660

                  650        660        670        680        690        700
22437   REVRGHLKKKRPEECDCHKISYHTQHKGRLKHRGSSLHPFRKGLQEKDKVWLLREQKRKK
               :::::::::::::::::::::::::::::::::::::::::::::::: :: :::
1247    REVRGHLKKKRPEECDCHKISYHTQHKGRLKHRGSSLHPFRKGLQEKDKVWLLREQKRKK
                  670        680        690        700        710        720
```

Fig. 4C

Title: "22437, A Novel Human Sulfatase and Uses Therefor"
Inventors: Maria A. Glucksmann et al.
U.S. Patent Appl. No.: **Not Yet Assigned**
Express Mail # EL665882062US Attorney Docket No. 10147-61U1 Cust # 570

30 / 30

```
                710        720        730        740        750        760        770        780
22437  KLRKLLKRLQNNDTCSMPGLTCFTHDNQHWQTAPFWTLGPFCACTSANNNTYWCMRTINE
       :: ::: :::: ::: :: ::: :::: :: ::: ::: ::::: :::: ::: ::::::: :: :::
1247   KLRKLLKRLQNNDTCSMPGLTCFTHDNQHWQTAPFWTLGPFCACTSANNNTYWCMRTINE
                730        740        750        760        770        780

                770        780        790        800        810        820        830        840
22437  THNFLFCEFATGFLEYFDLNTDPYQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQCNPR
       :: ::: :::: ::: :: ::: :::: :: ::: ::: ::::: :::: ::: ::::::: :: :::
1247   THNFLFCEFATGFLEYFDLNTDPYQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQCNPR
                790        800        810        820        830        840

                830        840        850        860        870
22437  TRNMDLGLKDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWEG
       :: ::: :::: ::: :: ::: :::: :: ::: ::: :::
1247   TRNMDLGLKDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWEG
                850        860        870        880
```

Fig. 4D